UCT-0045
PFO-0002

IN THE CLAIMS

1. (Original) A method of separating *met*-SWNTs from *sem*-SWNTs, the method comprising:

suspending a population of functionalized SWNTs in a suspending solvent, and

employing a means for inducing selective precipitation, wherein selective precipitation comprises precipitating a majority of the *met*-SWNTs while leaving a population of the *sem*-SWNTs in suspension, or precipitating a majority of the *sem*-SWNTs while leaving a population of the *met*-SWNTs in suspension.

2. (Currently Amended) The method of claim 1, wherein the SWNTs ~~are single walled~~ consist of carbon ~~nanotubes~~.

3. (Original) The method of claim 1, further comprising functionalizing a population of SWNTs prior to suspending the population of functionalized SWNTs, wherein functionalizing comprises:

treating a population of SWNTs with a functionalizing agent, and

heating at a temperature and time sufficient to associate the functionalizing agent with the SWNTs.

4. (Original) The method of claim 3, wherein the functionalizing agent comprises an acid, a surfactant amine, or a combination comprising one or more of the foregoing agents.

5. (Original) The method of claim 1, wherein the population of functionalized SWNTs comprises an acid functionality and a surfactant amine functionality, and wherein selective precipitation comprises precipitating the majority of the *met*-SWNTs while leaving the population of the *sem*-SWNTs in suspension.

6. (Original) The method of claim 5, wherein the surfactant amine functionality is octadecylamine, butylamine, *sec*-butylamine, *tert*-butylamine, pentylamine, hexylamine, heptylamine, octylamine, nonylamine, decylamine, dodecylamine, tetradecylamine, hexadecylamine, eicosadecylamine, tetracontylamine, pentacontyl-amine, 10,12-pentacosadiynoylamine, 5,7-eicosadiynoylamine, benzyl amine, aniline, phenethyl amine, *N*-methylaniline, *N,N*-dimethylaniline, 2-amino-styrene, 4-pentylaniline, 4-dodecylaniline, 4-tetradecylaniline, 4-pentacosylaniline, 4-tetracontylaniline, 4-pentacontylaniline, or a combination comprising one or more of the foregoing amines.

7. (Original) The method of claim 5, wherein the suspending solvent comprises an ether, an acetate, an aliphatic hydrocarbon, an aromatic hydrocarbon, a chlorinated solvent, or a combination comprising one or more of the foregoing solvents.

8. (Original) The method of claim 5, wherein the means for inducing selective precipitation comprises centrifuging the suspension, increasing the temperature of the suspension, decreasing the temperature of the suspension, increasing the concentration of the functionalized nanotubes in the suspension, evaporating the suspending solvent in the suspension, adding a non-solvent to the suspension, adding a compound with a high dielectric constant to the suspension, adding an ionic compound to the suspension, adding a non-polar agent to the suspension, adding a complexing cation to the suspension, adding a reducing agent to the suspension, adding an oxidizing agent, or a combination comprising one or more of the foregoing means.

9. (Original) The method of claim 1, wherein the functionalized SWNTs comprise an acid functionality, and wherein selective precipitation comprises precipitating the majority of the *sem*-SWNTs, while leaving the population of the *met*-SWNTs in suspension.

10. (Original) The method of claim 9, wherein the means for inducing selective precipitation comprises adding a non-surfactant amine to the suspension, centrifuging the suspension, increasing the temperature of the suspension, decreasing the temperature of the suspension, increasing the concentration of the functionalized nanotubes in the suspension, evaporating the suspending solvent in the suspension, adding a non-solvent to the suspension, adding a compound with a high dielectric constant to the suspension, adding an ionic compound to the suspension, adding a non-polar agent to the suspension, adding a complexing cation to the suspension, adding a reducing agent to the suspension, adding an oxidizing agent, or a combination comprising one or more of the foregoing means.

11. (Original) The method of claim 10, wherein the non-surfactant amine is ammonia, methylamine, ethylamine, propylamine, isopropylamine, butylamines, *N,N*-dimethylamine, *N,N*-methylethylamine, *N,N*-diethylamine, *N,N*-ethylpropylamine, *N,N*-dipropylamine, ethyleneamine, propyleneamine, butyleneamine, pentyleneamine, hexyleneamine, heptyleneamine, octyleneamine, nonyleneamine, decyleneamine, dodecyleneamine, tetradecyleneamine, hexadecyleneamine, eicosadecyleneamine, tetracontyleneamine, pentacontyleneamine, 10,12-pentacosadiynoylene-α,ω-diamine, 5,7-eicosadiynoylene-α,ω-diamine, piperazine, 1,4-phenylenediamine, *p*-xylylenediamine, pentaethylenehexamine, triethylenetetraamine, N,N'-bis(3-aminopropyl)-1,3-propanediamine, N,N'-bis(3-aminopropyl)-1,3-butanediamine, or a combination comprising one or more of the foregoing amines.

12. (Original) The method of claim 9, wherein the suspending solvent comprises a polar solvent.

13. (Original) The method of claim 12, wherein the polar solvent is dimethylformamide, dimethylacetamide, formamide, methyl formamide, hexamethylenephosphormamide, dimethylsulfoxide, or a combination comprising one or more of the foregoing polar solvents.

UCT-0045
PFO-0002

14. (Original) A method for selective extraction of *sem*-SWNTs from a mixture of *sem*-SWNTs and *met*-SWNTs, comprising

contacting a population of non-acid functionalized SWNTs with an surfactant amine, to form a population of surfactant amine functionalized *sem*-SWNTs and

extracting the population of surfactant amine functionalized *sem*-SWNTS with a means for solvent extraction while leaving a majority of the *met*-SWNT behind.

15. (Original) The method of claim 14, wherein the means for solvent extraction comprises contacting the *sem*-SWNTs with a nonpolar solvent saturated with a surfactant amine.

16. (Original) The method of claim 15, wherein the nonpolar solvent is an ether, an acetate, an aliphatic hydrocarbon, an aromatic hydrocarbon, a chlorinated solvent, or a combination comprising one or more of the foregoing solvents.

17. (Original) The method of claim 15, wherein the nonpolar solvent further comprises an agent that modifies a property of the means for solvent extraction, and wherein the property is solvent polarity, ionic strength, redox potential, complexing efficiency, or a combination comprising one or more of the foregoing properties.

18. (Original) The method of claim 14, further comprising employing a naonotube dispersion selected from filtration, centrifugation, sedimentation at high or low temperatures, or a combinations thereof.

UCT-0045
PFO-0002

19. (Original) A method of separating *sem*-SWNTs or *met*-SWNTs by diameter to form a diameter-separated population of *sem*-SWNTs or *met* SWNTs, comprising

suspending an enriched population of functionalized *sem*-SWNTs or an enriched population functionalized *met*-SWNTs in a suspending solvent to form a functionalized *sem*-SWNT suspension or a functionalized *met*-SWNT suspension, and

employing a means for selectively precipitating according to diameter the functionalized *sem*-SWNTs or functionalized *met*-SWNTs,

wherein the enriched population of functionalized *sem*-SWNTs comprises greater than or equal to about 66 wt% *sem*-SWNTs or the enriched population of functionalized *met*-SWNTs comprises greater than or equal to about 66 wt% *met*-SWNTs.

20. (Original) The method of claim 19, wherein the means for selectively precipitating according to diameter comprises a non-surfactant amine to the suspension, centrifuging the suspension, increasing the temperature of the suspension, decreasing the temperature of the suspension, increasing the concentration of the functionalized nanotubes in the suspension, evaporating the suspending solvent in the suspension, adding a non-solvent to the suspension, adding a compound with a high dielectric constant to the suspension, adding an ionic compound to the suspension, adding a non-polar agent to the suspension, adding a complexing cation to the suspension, adding a reducing agent to the suspension, adding an oxidizing agent, or a combination comprising one or more of the foregoing means.

21. (Original) The method of claim 20, wherein the non-surfactant amine is ammonia, methylamine, ethylamine, propylamine, isopropylamine, butylamines, *N,N*-dimethylamine, *N,N*-methylethylamine, *N,N*-diethylamine, *N,N*-ethylpropylamine, *N,N*-dipropylamine, ethyleneamine, propyleneamine, butyleneamine, pentyleneamine, hexyleneamine, heptyleneamine, octyleneamine, nonyleneamine, decyleneamine, dodecyleneamine, tetradecyleneamine, hexadecyleneamine, eicosadecyleneamine, tetracontyleneamine, pentacontyleneamine, 10,12-pentacosadiynoylene-α,ω-diamine, 5,7-eicosadiynoylene-α,ω-diamine, piperazine, 1,4-phenylenediamine, *p*-xylylenediamine, pentaethylenehexamine, triethylenetetraamine, N,N'-bis(3-aminopropyl)-1,3-propanediamine, N,N'-bis(3-aminopropyl)-1,3-butanediamine, or a combination comprising one or more of the foregoing amines.

22. (Original) The method of claim 19, wherein the suspending solvent comprises a polar solvent.

23. (Original) The method of claim 19, wherein the polar solvent is dimethylformamide, dimethylacetamide, formamide, methyl formamide, hexamethylenephosphormamide, dimethylsulfoxide, or a combination comprising one or more of the foregoing polar solvents.